NRC INSPECTION MANUAL

PART 9900: TECHNICAL GUIDANCE

RG115_A4.TG

REGULATORY GUIDE 1.16
PARAGRAPH C.2.a(4)
REPORTING REQUIREMENTS - REACTIVITY ANOMALIES

A. PURPOSE

To provide guidance to the IE inspector concerning the type of reactivity anomalies and additions that should be reported to the Commission.

B. DISCUSSION

Section C.2.a(4) of Revision 4 to Regulatory Guide 1.16 establishes reporting requirements for reactivity anomalies and conditions which occur during shutdown and steady state operation. Experience has shown that this requirement may not be uniformly interpreted by all licensees.

For ease of discussion, section C.2.a(4) is herein restated and commented upon in discrete segments.

Item 1 Reactivity anomalies involving disagreement with the predicted value of reactivity balance under steady-state conditions during power operation greater than or equal to 1% $\triangle K/K$.

Discussion Item 1. This covers an unplanned deviation from the total reactivity value expected at any time in core life. Whether the anomaly is in a positive or negative direction does not affect its reportability. This reactivity balance determination is usually made and checked against the expected value at discrete times (EFPH) in core life.

Item 2 A calculated reactivity balance indicating a shutdown margin less conservative than specified in the technical specifications.

Discussion Item 2. This covers the reactivity status at any time there is fuel in the reactor and applies regardless of cause. Typical causes could include inadvertent deboration while subcritical, improper control rod configuration such as control rods

in a PWR inserted beyond limits, inadequate control rod strength, or an over reactive core.

Item 3 Short-term reactivity increases that correspond to a reactor period of less than 5 seconds.

Discussion Item 3. This covers short periods caused by events such as cold water injection, rapid rod motion, and abnormal flux distribution resulting in high control rod notch worth. It is not meant to require reporting of analyzed transients where the excursion is expected, understood and automatically terminated. For example, turbine trips or MSIV closure on a BWR cause substantial short term positive reactivity feedback but need not be reported under this item.

Item 4 If subcritical, an unplanned reactivity insertion of more than 0.5% $\Delta K/K$.

Discussion Item 4. The emphasis here is on unplanned reactivity increases such as those caused by inadvertent boron dilution, addition of cold water, or control rod drift.

Item 5 Occurrence of any unplanned criticality.

Discussion Item 5. This emphasis is on equipment malfunction or personnel error resulting in criticality which occurs under conditions other than preplanned. Examples are inadvertent boron dilution, testing of control rods, and inadvertent cold water addition.

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